



PATENT

IN THE U.S. PATENT AND TRADEMARK OFFICE

Appellants: Johan ULIN, et al.
Appl. No.: **10/539,045**
Filed: March 6, 2006
Conf. No.: 7386
Group: 1772
Examiner: Dennis Michael White
For: VESSEL FOR PERFORMING MICROWAVE-ASSISTED CHEMISTRY ON SMALL VOLUMES OF REAGENTS
Atty. Dkt. No.: 12090-000016/US

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December 23, 2010

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. §41.37

Sir:

Appellants submit herewith their Brief on Appeal as required by 37 C.F.R. § 41.37.

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BRIEF ON BEHALF OF APPELLANTS

In support of the Notice of Appeal filed on October 27, 2010, appealing the Examiner's Final rejection mailed on August 2, 2010 of each of pending claims 15-29 of the present application which appear in the attached claims appendix, Appellants hereby provide the following remarks.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is **Biotage AB**, as evidenced by the Assignment recorded at Reel 017644 and Frame 0272.

II. RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will affect, be directly affected by, or have a bearing on the Board of Patent Appeals and Interferences (hereinafter 'the Board') decision in this Appeal.

III. STATUS OF CLAIMS

Claims 15-29 are currently pending in the present application, of which claims 15 and 29 are the independent claims on appeal. Appellants respectfully request the designated panel of examiners (Panel) to review the rejection of claims 15-21 and 23-29 under 35 U.S.C. § 103(a) as being unpatentable over Jennings, U.S. Patent Publication No. 2002/0101310 in view of Commarmot et al. ("Commarmot"), U.S. Patent No. 4,693,867; and the rejection of claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Jennings in view of Commarmot, and further in view of Bennett et al. ("Bennett"), U.S. Patent No. 5,520,886.

IV. STATUS OF AMENDMENTS

On June 3, 2010, Appellants filed a Reply under 37 C.F.R. § 1.111 in response to the Office Action mailed March 3, 2010. The Reply of June 3, 2010, made amendments to the claims, and all amendments that were made on and prior to the Reply of June 3, 2010, have been entered by the Examiner. Accordingly, the claims set forth in the Claims Appendix correspond exactly to those addressed by the Examiner in the Office Action Made Final mailed August 2, 2010.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 15 is directed to a micro-vial assembly for performing microwave-assisted chemical reactions on small mixture volumes. The micro-vial assembly may include a micro-wave transparent reaction vessel (e.g., element 10) having an open upper end and a closed bottom end, a cap (e.g., element 40) having a through hole, a sealing diaphragm (e.g., element 30), and a sleeve (e.g., element 20). *See FIGS. 2 and 3.* The sleeve 20 may be formed with a through hole so that the reaction vessel 10 may extend axially through the sleeve.¹ The cap 40 may extend over the diaphragm 30 and the sleeve 20 so as to secure the reaction vessel to the sleeve while clamping the diaphragm for sealing the open upper end of the vessel.² The open upper end of the vessel may be formed with a widening portion, wherein the widening portion is received in a corresponding recess formed in an end plane of the sleeve, and the recess providing a seat for the widening portion in the open upper end of the vessel.³ As such, the geometry in the upper end of the reaction vessel

¹ See paragraph [0024] of corresponding U.S. published application.

² See paragraphs [0029] and [0030] of corresponding U.S. published application.

³ See paragraph [0023] of corresponding U.S. published application.

may facilitate reflux of liquid and minimize the risk of solvent and/or reaction mixture sticking to the inner surface of the reaction vessel.⁴

Independent claim 29 is directed to a micro-vial assembly for performing microwave-assisted chemical reactions on small mixture volumes. The micro-vial assembly may include a cap (e.g., element 40) having a through hole, a sealing, elastic diaphragm (e.g., element 30), and a sleeve (e.g., element 20) having a through hole. *See FIGS. 2 and 3.* The cap, the diaphragm, and the sleeve may be configured to be assembled with a micro wave transparent reaction vessel (e.g., element 10) having an open upper end and a closed bottom end, so that upon assembly, the reaction vessel may extend axially through the sleeve.⁵ In addition, the cap may extend over the diaphragm and the sleeve to secure the vessel to the sleeve and clamp the diaphragm for sealing the open upper end of the reaction vessel.⁶ The open upper end of the reaction vessel may be formed with a widening portion, wherein the widening portion may be received in a corresponding recess formed in an end plane of the sleeve, and the recess may provide a seat for the widening portion in the open upper end of the vessel.⁷

VI. GROUND(S) OF REJECTION TO BE REVIEWED ON APPEAL

Appellants seek the Board's review of the rejection of:

1) claims 15-21 and 23-29 under 35 U.S.C. § 103(a) as being unpatentable over Jennings, U.S. Patent Publication No. 2002/0101310 in view of Commarmot et al. ("Commarmot"), U.S. Patent No. 4,693,867; and

⁴ See paragraph [0023], lines 1-4, of corresponding U.S. published application.

⁵ See paragraphs [0021] and [0022] of corresponding U.S. published application.

⁶ See paragraphs [0029] and [0030] of corresponding U.S. published application.

⁷ See paragraph [0023] of corresponding U.S. published application.

2) claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Jennings in view of Commarmot, and further in view of Bennett et al. ("Bennett"), U.S. Patent No. 5,520,886.

VII. ARGUMENTS

A. **CLAIMS 15-21 AND 23-29 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER JENNINGS IN VIEW OF COMMARMOT.**

Appellants submit that claims 15-29 are patentable for features that are present in each claim; nevertheless Appellants submit that the claims are argued in two groups. Group I includes claims 15-28, which rise and fall together, with claim 15 being representative. Group II includes claim 29, which rise and fall together, with claim 29 being representative.

i. CLAIM 15

Cited Art Fails to Disclose All the Limitations of the Claims

Appellants respectfully submit that the Jennings and the Commarmot references, individually or in combination, fail to disclose, or even suggest, *inter alia*:

the cap extending over the diaphragm and the sleeve so as to secure the vessel to the sleeve while clamping the diaphragm for sealing the open upper end of the vessel. (*emphasis added*)

In particular, Appellants respectfully submit that none of the applied references disclose the cap 40 extending over the diaphragm 30 and the sleeve 20. In this regard, FIG. 5 is reproduced below.

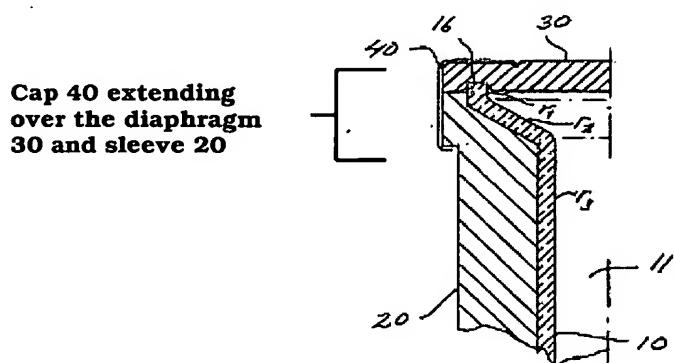


Fig. 5

In the outstanding Final Office Action mailed August 8, 2010, the rejection is based on an assertion that the collet assembly “**91**” of Jennings corresponds to the “cap” member of claim 15. In particular, the Examiner asserts that “[t]he collet assembly 91 contacts the septum 134 at 106 (“extending over the diaphragm”) and further extends over the attenuator 33 at 107 (“extending over the sleeve”).”⁸ Appellants respectfully disagree.

Specifically, as shown in FIG. 11 of Jennings, the collet 91 does not “**extend over**” the attenuator (“sleeve”), but merely positioned within (or inside) the attenuator 33. Thus, the collet 91 does not “extend over” the septum 134 (“diaphragm”) and the attenuator 33 (“sleeve”).

In fact, after carefully reviewing the disclosure of Jennings, Appellants submit that the corresponding “cap” of claim 15 appears to be the deformable metal portion **133** of cap assembly 132 in Jennings. *See paragraphs [0076] and [0084]; and FIG. 14 of Jennings.* However, it is respectfully submitted that the metal portion 133 of cap assembly 132 only extends over the septum 134 (“diaphragm”) and the vessel 105; and not extending over the diaphragm and the sleeve – see FIG. 11.

⁸ See Final Office Action mailed August 2, 2010, page 8, paragraph 4.

Accordingly, Appellants respectfully submit that the Jennings and the Commarmot references, individually or in combination, fail to disclose, or even suggest, "the cap extending over the diaphragm and the sleeve so as to secure the vessel to the sleeve while clamping the diaphragm for sealing the open upper end of the vessel," as recited in claim 15.

Since the rejection fails to disclose or suggest each and every element of the rejected claims, Appellants respectfully submit that no *prima facie* case of obviousness has been established with respect to claim 1.

In view of the above, Appellants respectfully submit that the Jennings and the Commarmot references fail to teach or suggest each and every element of claim 15, and therefore, claim 15 is allowable over the cited prior art. Claims 16-21 and 23-28 are dependent from claim 15, and therefore, also allowable. Accordingly, Appellants respectfully request that the rejection under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

No Motivation to Modify the Prior Art in the Manner Asserted by Examiner

Further, Appellants respectfully submit that the Examiner is mis-applying the law regarding motivation to combine, and respectfully submit that the Examiner failed to set forth a *prima facie* case of obviousness for at least the reasons set forth below.

In the outstanding Final Office Action, the Examiner contends that:

it would have been obvious to one of ordinary skill in the art to substitute the sleeve 86 of Commarmot with the attenuator of Jennings because they are known sleeves to hold microwave reaction vessels in a defined position during the reaction.⁹

See Final Office Action mailed August 2, 2010, page 5, first full paragraph.

⁹ Appellants further submit that the above statement is merely conclusory and do not comprise an "*explicit rationale*" as required by KSR Int'l Co. v. Teleflex, Inc. (550 U.S. at 398, 82 USPQ2d at 1396 (2007)).

However, Appellants respectfully submit that the mere *substitution* of a sleeve member is insufficient to establish a motivation to combine. In particular, Appellants note that the relevant inquiry is not whether the Commarmot reference discloses a sleeve with a widening portion, but rather whether one or ordinary skill in the art would desire to combine the Commarmot and the Jennings references in order to arrive at the claimed invention. See, e.g., MPEP § 2143.01(III), which states “[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination,” citing *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). That is, establishing motivation requires the Examiner to demonstrate why one of ordinary skill in the art, absent the teachings of Appellants' application, would want to substitute the sleeve member of Commarmot with the sleeve member of Jennings. For instance, the Commarmot reference discloses a cover 90 in abutment on the upper edge of ring 88 including a tube 95 in permanent relation with a supple pipe leading to a pumping and suction unit (see col. 8, lines 40-50). The pumping and suction unit is started up in synchronized manner necessary for ensuring removal of the fumes and vapors released by the reaction (see, e.g., col. 10, line 35-42). Accordingly, it follows that there cannot be any diaphragm (as taught in Jennings) in the apparatus according to Commarmot because a diaphragm would keep such fumes/vapors in the reaction vessel and the suction unit would not be able to remove the fumes/vapors.

Moreover, it is respectfully submitted that the Commarmot reference teaches away from “sealing” the diaphragm. More specifically, there cannot be any diaphragm in the apparatus according to Commarmot, because again such a diaphragm would keep fumes/vapors locked inside the reaction vessel, and the

suction unit would not be able to remove the fumes/vapors through the cover 90 as required.

Furthermore, even if the skilled person would be motivated by Commarmot to replace the sleeve member in the device according to Jennings (*in which Appellants do not admit to or agree to*), this could only be done in a certain manner. The most obvious way being simply to replace the vessel (14) of Commarmot with the vessel (105) of Jennings. However, there is no teaching, suggestion or motivation in either document to use a cap to clamp together the vessel, diaphragm and the sleeve together. The sleeve (33) of Commarmot is already clamped by jaws (82) and it is not obvious how further clamping means should be introduced. Therefore, the rejection failed to articulate a proper rationale to support an obviousness rejection.

Furthermore, in order establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the U.S. Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*¹⁰ noted that the rejection must establish a reasoning that it would have been obvious for one of ordinary skill in the art to have combined the teachings of the cited document(s). One way to establish this would be to show "some articulated reasoning with some rationale underpinning to support the legal conclusion of obviousness" and "identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does."¹¹ Appellants respectfully submit that the Examiner failed to articulate a reason with some rationale underpinning to support the legal conclusion of obviousness and identify a reason that would have prompted a person of ordinary skill in the art to combine the elements in the manner asserted by the Examiner.

¹⁰ 550 U.S. at 398, 82 USPQ2d at 1396 (2007).

¹¹ *Id.*

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The Examiner's statement that "it would have been obvious to one or ordinary skill in the art to substitute the sleeve 86 of Commarmot with the attenuator of Jennings because they are known sleeves to hold microwave reaction vessels in a defined position during the reaction" is merely conclusory, and not an articulated reasoning with some rationale underpinning. Moreover, as recently held by the Board of Patent Appeals and Interferences in Ex parte United Technologies Corp., Appeal No. 2009-006732, such statement made herein by the Examiner is merely an assertion that does not amount to a *prima facie* case for obviousness. In particular, the Examiner has not explained why sleeves holding microwave reaction vessels in a defined position during the reaction is "known" or point to any factual support for that determination. The initial burden is on the Examiner to provide a factual basis to support an obviousness conclusion – see also *In re Warner*, 379 F.2d at 1017. Appellants submit that no such basis has been provided. Moreover, even if holding microwave reaction vessels in a sleeve is "known," the Examiner has not articulated why that knowledge would have been known to one with ordinary skill in the art.

In view of the above, Appellants respectfully submit that one of ordinary skill in the art would not have combined the teachings of the Jennings and the Commarmot references in the manner used to reject the claims, and that the proposed combination of the Jennings and the Commarmot references, individually or in combination, fails to teach or suggest all of the elements of claim 15. Thus, no *prima facie* case of obviousness has been established. Accordingly, claim 15 is allowable over the Jennings and the Commarmot references. Dependent claims 16-21 and 23-28 depend from claim 15 and are allowable for at least the reasons that claim 15 is allowable. Therefore, Appellants respectfully request that the rejection of claims 15-28 under 35 U.S.C. § 103(a) be favorable reconsidered and withdrawn.

ii. CLAIM 29

Independent claim 29 is similarly directed to a micro vial assembly including, *inter alia*, "the cap extends over the diaphragm and the sleeve to secure the vessel to the sleeve and clamps the diaphragm for sealing the open upper end of the vessel."

For similar reasons as given above with respect to independent claim 15, Appellants submit that Jennings and Commarmot fail to explicitly teach, or otherwise suggest, all of the features recited in independent claim 29.

B. CLAIM 22 UNDER 35 U.S.C. §103(a) AS BEING UNPATENTABLE OVER JENNINGS AND COMMARMOT WITH EVIDENCE PROVIDED BY BENNETT.

For similar reasons as given above with respect claim 15, Appellants submit that there is no motivation in Bennett to provide the bottom of the vessel above the terminal end of the vessel. Thus, there is no motivation to combine the teaching of Jennings, Commarmot, and Bennett.

Claim 22 is patentable over the combination of Jennings, Commarmot, and Bennett for its own merits, as well as by virtue of its dependency on independent claim 15.

CONCLUSION

In view of the above, Appellants respectfully request that the Board reverse the Examiner's obviousness rejection of claims 15-29.

The Commissioner is authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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- VII. Claims Appendix
- IX. Evidence Appendix
- X. Related Proceeding Appendix

VIII. CLAIMS APPENDIX

15. A micro vial assembly for performing microwave-assisted chemical reactions on small volumes, the assembly comprising:

a micro-wave transparent reaction vessel having an open upper end and a closed bottom end;

a cap having a through hole;

a sealing diaphragm; and

a sleeve,

wherein the sleeve is formed with a through hole, the vessel extending axially through the sleeve, the cap extending over the diaphragm and the sleeve so as to secure the vessel to the sleeve while clamping the diaphragm for sealing the open upper end of the vessel, the open upper end of the vessel being formed with a widening portion, the widening portion being received in a corresponding recess formed in an end plane of the sleeve, and the recess providing a seat for the widening portion in the open upper end of the vessel.

16. The micro vial assembly of claim 15, wherein the upper end of the sleeve is formed circumferentially for engagement with the cap, the sleeve having a first diameter portion running from the upper end to meet a reduced diameter portion in the lower end of the sleeve.

17. The micro vial assembly of claim 16, wherein the portion of reduced diameter in the lower end of the sleeve is a truncated cone.

18. The micro vial assembly of claim 15, wherein the widening portion of the vessel and the seat in the end plane of the sleeve are both conical in shape.

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19. The micro vial assembly of claim 15, wherein the open end of the vessel is defined by a rim protruding above the upper end of the sleeve, when the vessel is supported in the sleeve, the rim being dimensioned to be depressed in the lower side of the diaphragm.

20. The micro vial assembly of claim 19, wherein the rim has an inner perimeter extending transversely to the diaphragm, sealing the open end of the vessel.

21. The micro vial assembly of claim 20, wherein the inner perimeter of the rim defines a portion of the vessel cavity having a first radius, said first radius portion meeting a second portion, the reducing radius portion smoothly transforming into a portion of continuous radius defining a reaction chamber of the verse cavity.

22. The micro vial assembly of claim 15, wherein a bottom of the vessel is formed through a radial compression of the vessel, located above the terminal end of the vessel.

23. The micro vial assembly of claim 15, wherein the vessel has an inner volume including a head-space volume which is less than 20 times that of the smallest reaction mixture volume contained in the vessel.

24. The micro vial assembly of claim 15, wherein the vessel is dimensioned for performing microwave-assisted chemical reactions on small volumes of 500 μ l or less.

25. A system for performing microwave-assisted chemical reactions on small reaction mixture volumes, comprising a micro vial assembly according to claim 15.

26. The system of claim 25, wherein the outer perimeter of the sleeve is dimensioned for bridging the radial distance between a wall of the vessel and an entrance diameter, of a microwave cavity in the system.

27. A method of using a micro vial assembly according to claim 15 for performing microwave-assisted chemical reactions, including the step of initiating or accelerating said chemical reactions.

28. A method of using a system according to claim 25 for performing microwave assisted chemical reactions, including the step of initiating or accelerating said chemical reactions.

29. A micro vial assembly for performing microwave-assisted chemical reactions on small volumes, the assembly comprising:

a cap having a through hole;

a sealing, elastic diaphragm; and

a sleeve having a through hole,

wherein the cap, diaphragm, and sleeve are configured to assemble with a micro wave transparent reaction vessel having an open upper end and a closed bottom end, so that upon assembly:

the vessel extends axially through the sleeve,

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the cap extends over the diaphragm and the sleeve to secure the vessel to the sleeve and clamps the diaphragm for sealing the open upper end of the vessel,

the open upper end of the vessel is formed with a widening portion,

the widening portion is received in a corresponding recess formed in an end plane of the sleeve, and

the recess provides a seat for the widening portion in the open upper end of the vessel.

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IX. EVIDENCE APPENDIX

NONE

X. RELATED PROCEEDINGS APPENDIX

NONE

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